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(54) **Drive-through chamber type timber drying kiln.**

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Description

The present invention concerns a drive-through chamber type timber drying kiln, where timber loads to be dried are conveyed on a roller track or equivalent through a front door into the drying kiln, and from which drying kiln, subsequent to drying, the timber loads are removed on the opposite side of the drying kiln through a rear door, and in which drying kiln two or more drying chambers are connected in series each chamber being provided with its own means for treatment of drying air to operate independently so that individual drying conditions can be realized in each chamber independently of the other chambers.

So-called drive-through chamber type drying kilns are known in prior art. Their structure is such that drying kiln loads assembled of drying film packages are carried into the drying chamber on a roller track in front of them, whence the loads are pushed into the drying chamber. The dried loads are taken out through the opposite door of the drying chamber. It is an advantage of these chamber-type drying kilns known in the art that in them the load changing time is comparatively short. However, a disadvantage is the expensive realization of such drying kilns, because they require two opposite doors, and roller tracks on both sides of the drying chamber.

From AT—A—335 918 is known a continuous-operation drying channel comprising two loading zones. However, those zones are only separated from each other by means of an interspace. It is intended that the air should be circulating separately in the different zones, but to a large extent the circulating air in one zone becomes mixed with the circulating air in the adjacent zone. Therefore the temperature and moisture in different zones can only deviate to a very small extent from each other.

The object of the present invention is to provide a simple design by which the drawbacks mentioned can be substantially reduced, and to provide a chamber-type drying kiln in which the advantageous characteristics of the chamber-type drying kiln, mentioned above, are preserved.

For attaining these aims and those to be disclosed below, the invention is characterized in that each chamber is closed and separated from an adjacent chamber by means of a light-weight partition, and that the drying conditions being adjusted such that when the timber loads are being transferred from a first chamber to the next chamber, in this next chamber the drying process is carried on substantially from that point of the drying schedule which had been reached in the drying process in the previous chamber. In the following, the invention is described in detail reference being made to an embodiment example of the invention presented in the figures of the drawing attached, to the details of which the invention is not confined.

Fig. 1 presents in elevational view a chamber-type drying kiln of the invention. Fig. 1 is at the same time the vertical section along the line I-I indicated in Fig. 3.

Fig. 2 shows the vertical cross section II-II in Fig. 3.

Fig. 3 shows the horizontal section III-III in Fig. 2.

As shown in the figures, the chamber-type drying kiln comprises four drying chambers K_1, K_2, K_3 and K_4. The chambers K_1 and K_2 among themselves and the chambers K_3 and K_4 among themselves are connected in series. Thus, the chambers K_1 and K_2 in combination and the chambers K_3 and K_4 in combination constitute two chamber groups, both of them having only one front door 11 and one back door 13. Through the chamber groups K_1, K_2 and K_3, K_4 pass the roller tracks 10. The initial parts 10a at these roller tracks are located outside the doors 11, and similarly the ultimate ends 10b of the roller tracks 10 are located outside the rear doors 13. The timber loads P_1 to be dried are brought to the initial ends 10a of the roller tracks, and the finished dried loads P_3 are tkane off the ultimate ends 10b of the roller tracks 10.

The chamber-type drying kiln comprising two drying kiln groups is composed of outer walls 14 and partitions 16, of a roof 15, and of the front doors 11 and rear doors 13 mentioned. Between the first chambers K_1 and K_3 and the second chambers K_2 and K_4 are provided light-weight partitions 12, for instance made of flexible fabric-type material, because these partitions 12 need not be thermally lagging. The partitions 12 are advantageously of such kind that it is possible to push the drying kiln loads P_2 through them from the first chamber K_1, K_3 to the second chamber K_2, K_4.

Each drying chamber K_1-K_4 is provided with means by which circulation F_k of drying air through the timber loads P_2 and P_3 composed of packages provided with spacers is achieved. Said means comprise one or more blowers 20 and a heating radiator 21 placed in a duct 22. On the intake side of the blowers 20 in the duct 22 is introduced through ventilation ducts 26 an inlet air flow F_{in} from outdoors, and similarly, on the pressure side of the blowers 20, an outlet air from F_{out} is taken off through ventilation ducts 25. In connection with the ventilation ducts 25 and 26 are provided control dampers 23 and 24, by the aid of which, combined with regulation of the radiators 21, the drying capacity of the circulating air F_k is influencable. Said means are separated from the load space by a partition 17, which is open on both sides (apertures 18 and 19). Through one aperture 19 the circulating air can pass to one side of the load, and through the other aperture 18 it is enabled to return to the blowers, having in the meantime passed through the loads. The direction in which the air circulates is reversed at regular intervals, usually automatically.

The drive-through chamber type drying kiln described in the foregoing operates as follows. The first chambers K_1 and K_3 and the second

chambers K_3 and K_4 of the chamber groups operate independently. When loads P_2 are transferred from the first chambers K_1, K_3 into the second chambers K_2, K_4, drying is carried on subsequent to this transfer as if no transfer had taken place, in other words, after the transfer, one begins to follow the drying schedule in the second chambers K_2, K_4 starting at that point in the drying process which has been reached in the drying in the first chambers K_1, K_3. It is advantageous, to this end, if the circulating air flow F_k in the first chambers K_1, K_3 and in the second chambers K_2, K_4 have opposite direction.

As has been set forth, each group of chambers contains two drying chambers K_1, K_2, K_3, K_4. In certain applications there may be even more such chambers in series, for instance three or four.

It is thus understood that in accordance with the invention a drive-through chamber type drying kiln has been obtained in which for each chamber group K_1, K_2 and K_3, K_4 there are still only two doors 11 and 13 and only one roller track 10 or equivalent track system passing through the chambers.

Claims

1. A drive-through chamber type drying kiln, where timber loads (P) to be dried are conveyed on a roller track (10) or equivalent through a front door (11) into the drying chamber, and from which drying kiln the timber loads (P) subsequent to drying are removed on the opposite side of the drying kiln through a rear door (13), and in which drying kiln two or more drying chambers (K_1, K_2, K_3, K_4) are connected in series, each chamber being provided with its own means for treatment of drying air to operate indepenedently so that individual drying conditions can be realized in each chamber independently of the other chambers, characterized in that each chamber is closed and separated from an adjacent chamber by means of a light-weight partition (12), and that the drying conditions being adjusted such that when the timber loads are being transferred from a first chamber (K_1, K_3) to the next chamber (K_2, K_4), in this next chamber (K_2, K_4) the drying process is carried on substantially from that point of the drying schedule which had been reached in the drying process in the previous chamber (K_1, K_3).

2. Chamber drying kiln according to claim 1, characterized in that drying chambers (K_1, K_3) and (K_2, K_4) have been provided at least two in series and that chamber groups thus produced are disposed one or several in parallel with each other.

3. Chamber drying kiln according to claim 1 or 2, having on one side of the drying chamber an air circulation duct (22) with blower means (20), a heating radiator (21) and intake air and exhaust means (22, 24, 25, 26), characterized in that in the chambers (K_1, K_3, K_2, K_4) connected in series the circulating air flows (F_k) have been arranged to be opposite in direction.

4. Chamber drying kiln according to any one of claims 1 to 3, characterized in that the partition (12) is made of flexible fabric-like material.

Patentansprüche

1. Durchlauf-Kammertrockenofen, in dem die zu trocknenden Holzladungen (P) auf einer Rollenbahn (10) oder dergleichen durch eine vordere Tür (11) in die Trockenkammer gefördert werden, aus der die Holzladungen (P) nach dem Trocknen auf der entgegengesetzten Seite durch eine hintere Tür (13) entfernt werden, und in dem zwei oder mehr Trockenkammern (K_1, K_2, K_3, K_4) in Reihe miteinander verbunden sind, wobei jede dieser Trockenkammern ihre eigenen unabhängig arbeitenden Mittel zur Behandlung der Trocknungsluft besitzt, so daß in jeder Trockenkammer unabhängig von den anderen Trockenkammern individuelle Trocknungsbedingungen herstellbar sind, dadurch gekennzeichnet, daß jede Trockenkammer geschlossen und von einer benachbarten Trockenkammer durch eine Leichtbau-Zwischenwand getrennt ist, und daß die Trocknungsbedingungen so eingestellt sind, daß dann, wenn die Holzladung von einer ersten Trockenkammer (K_1, K_3) zu der nächsten Trockenkammer (K_2, K_4) verbracht wird, der Trocknungsprozeß in dieser nächsten Trockenkammer (K_2, K_4) im wesentlichen von demjenigen Punkt des Trocknungsplans aus durchgeführt wird, der in dem Trocknungsprozeß in der vorhergehenden Trokkenkammer (K_1, K_3) erreicht wurde.

2. Kammertrockenofen nach Anspruch 1, dadurch gekennzeichnet, daß wenigstens zwei Trockenkammern (K_1, K_3 und K_2, K_4) in Reihe angeordnet sind und daß auf diese Weise gebildete Gruppen von Trockenkammern einzeln oder zu mehreren parallel angeordnet sind.

3. Kammertrockenofen nach Anspruch 1 oder 2, bei dem auf einer Seite der Trockenkammer eine Luftzirkulationsleitung (22) mit Gebläsemitteln (20), ein Heizungsradiator (21) sowie Lufteinlaß- und -auslaßmittel (23, 24, 25, 26) vorgesehen sind, dadurch gekennzeichnet, daß in den in Reihe verbundenen Trockenkammern (K_1, K_3; K_2, K_4) die Luftzirkulationströme (F_k) se angeordnet sind, daß ihre Richtungen entgegengesetzt sind.

4. Kammertrockenofen nach einem der Ansprüche 1 bis 3, dadurch gekennzeichnet, daß die Zwischenwand (12) aus flexiblen gewebeartigen Material hergestellt ist.

Revendications

1. Four de séchage du type à chambres transitoires dans lequel des charges de bois (P) à sécher sont acheminées sur une ligne à rouleaux (10) ou un système équivalent, franchissent une porte avant (11) et pénètreant dans le four de séchage, après le séchage les charges de bois (P) étant évacuées sur le côté opposé du four de séchage à travers une porte arrière (13), four de séchage dans lequel deux ou plus de deux chambres de séchage (K_1, K_2, K_3 K_4) sont reliées en série, chaque chambre étant munie de son propre

moyen de traitement d'air de séchage de façon à fonctionner indépendamment et pouvoir obtenir des conditions de séchage individuel dans chaque chambre, indépendamment des autres chambres, caractérisé en ce que chaque chambre est fermée et séparée d'une chambre contiguë par une cloison légère (12) et en ce que les conditions de séchage sont ajustées de façon telle que lorsque les charges de bois sont transférées depuis une première chambre (K_1, K_3) jusqu'à la chambre suivante (K_2, K_4), le processus de séchage dans cette chambre suivante (K_2, K_4) s'effectue sensiblement à partir du stade du programme de séchage qui avait été atteint dans la chambre précédente (K_1, K_3).

2. Four de séchage à chambres transitoires selon la revendication 1, caractérisé en ce que les chambres de séchage (K_1, K_3 et K_2, K_4) sont au nombre d'au moins deux en série, et en ce que les groupes de chambres ainsi constitués sont disposés parallèlement l'un ou plusieurs par rapport à l'utre.

3. Four de séchage à chambres transitoires selon la revendication 1 ou 2, comportant sur un côté de la chambre de séchage une canalisation de circulation d'air (22) avec une soufflante (20), un radiateur de chauffage (21) et des moyens d'admission et d'évacuation d'air (23, 24, 25, 26), caractérisé en ce que dans les chambres (K_1, K_3, K_2, K_4) reliées en série, les courants d'air de circulation (F_K) ont été agencés de façon à être de sens opposés.

4. Four de séchage à chambres transitoires selon l'une quelconque des revendications 1 à 3, caractérisé en ce que la cloison (12) est en un matériau souple du type tissu.

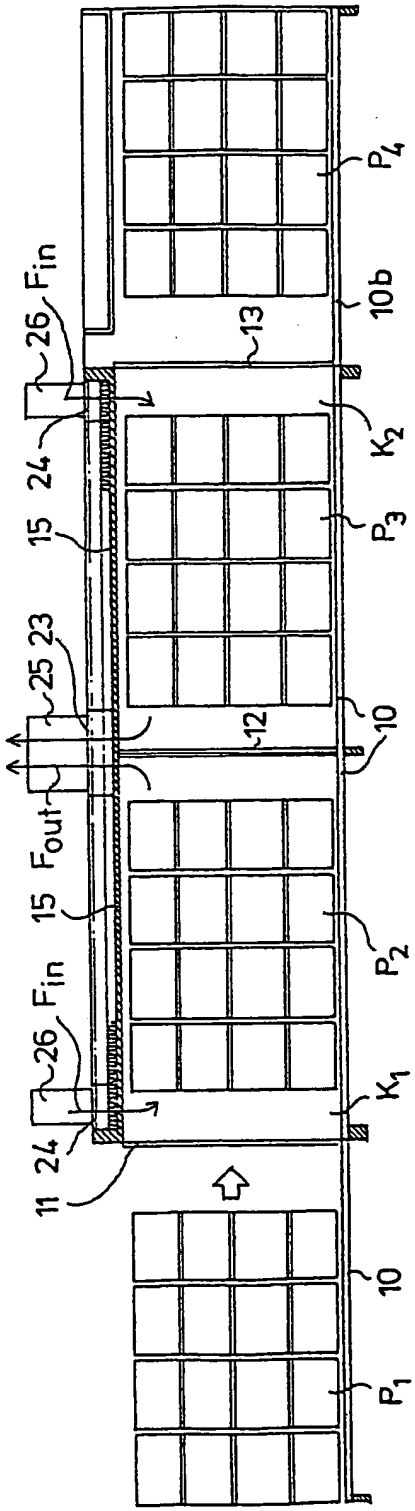
P4
Fin
26
10b
13
K2
24
15
P3
25
23
12
10
Fout
15
P2
Fin
26
K1
24
11
10
P1

FIG.1

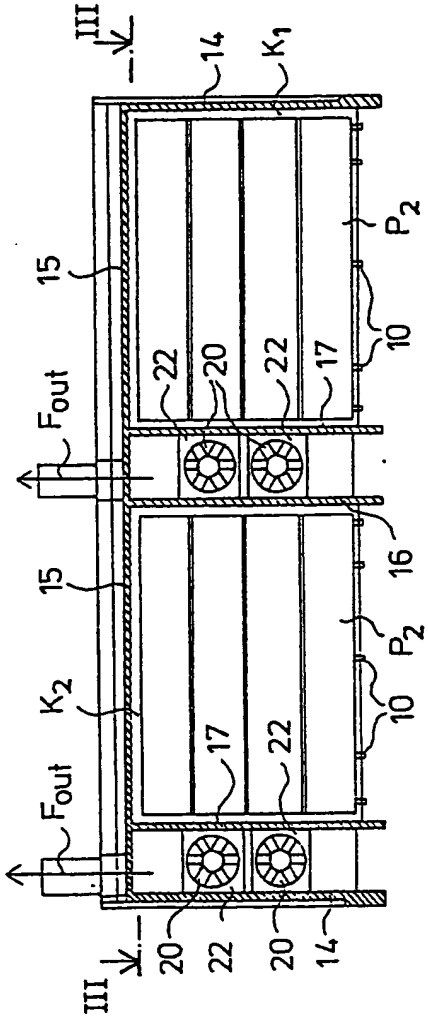
III
14
K1
15
P2
22
20
22
17
10
Fout
16
15
P2
K2
17
22
10
Fout
III
20
22
20
14

FIG.2

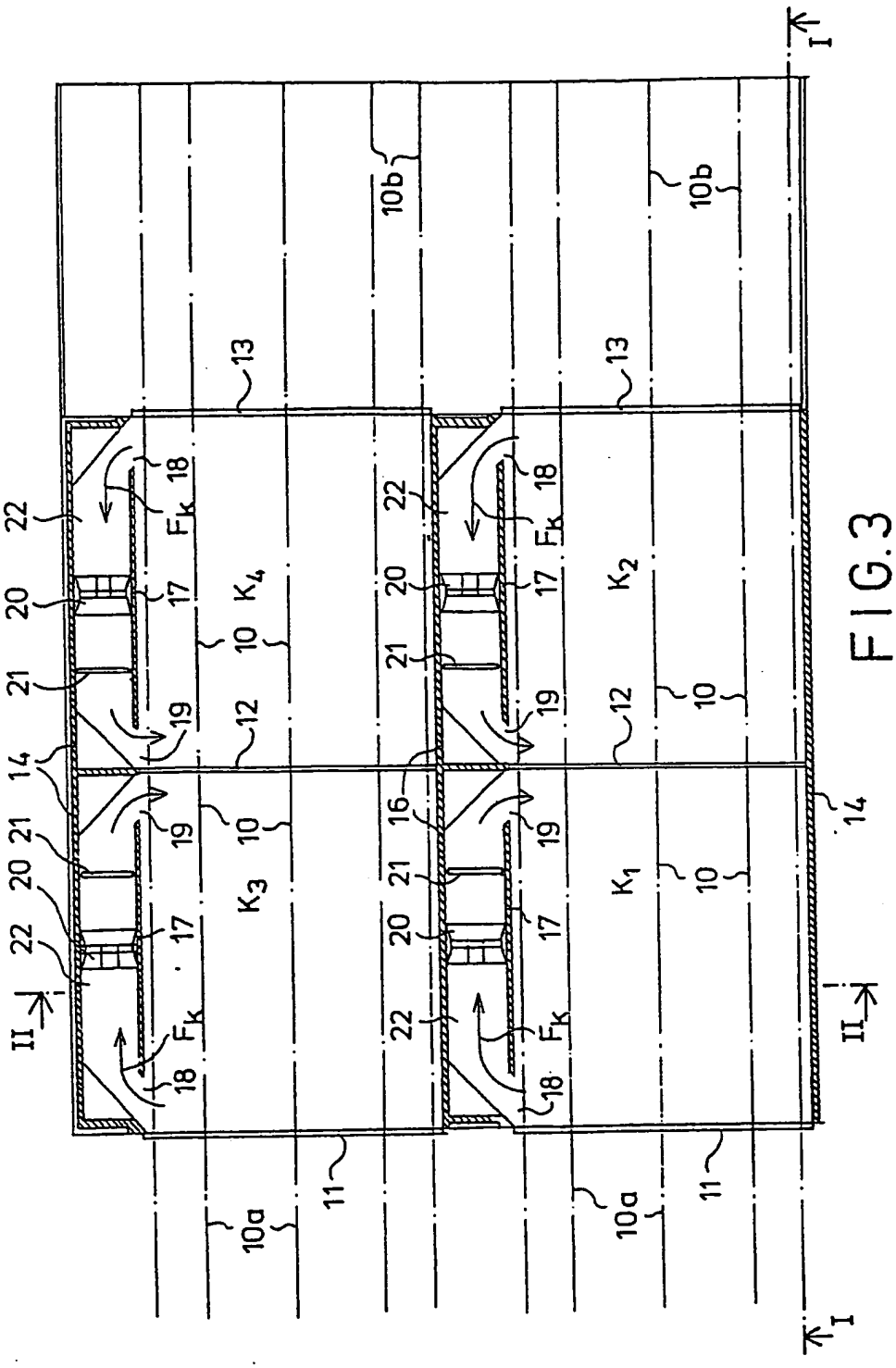

FIG.3